

NON-PUBLIC?: N  
ACCESSION #: 8910270113  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: South texas, Unit 2 PAGE: 1 OF 3

DOCKET NUMBER: 05000499

TITLE: Reactor Trip Due to Actuation of the Overtemperature Delta  
Temperature Turbine Runback Circuit  
EVENT DATE: 09/19/89 LER #: 89-022-00 REPORT DATE: 10/19/89

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION:  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:  
NAME: Charles Ayala - Supervising Licensing Engineer

TELEPHONE: 512-972-8628

COMPONENT FAILURE DESCRIPTION:  
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:  
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

#### ABSTRACT:

On September 19, 1989, Unit 2 was in Mode 1 at 100 percent power. At 1237 hours during the cross calibration of the incore and excore nuclear instrumentation, an Overtemperature Delta Temperature (OTDT) turbine runback occurred resulting in an OTDT reactor trip. The turbine tripped on the reactor trip and an auxiliary feedwater actuation occurred on low steam generator level. The Main Steam Isolation Valves were closed to prevent excessive Reactor Coolant System cooldown. The Engineered Safety Features functioned as designed. The cause of this event was that the turbine runback setpoint design did not provide sufficient operating margin to allow for small deviations in RCS average temperature. The OTDT runback feature has been disabled and analysis is being performed to determine if it can be restored without causing unwanted plant transients.

END OF ABSTRACT

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DESCRIPTION OF OCCURRENCE:

On September 19, 1989, Unit 2 was in Mode 1 at 100% percent power. Cross calibration of the incore and excore nuclear instrumentation was being performed. Control room operators were using manual control rod motion with boration and dilution to control neutron flux distribution and Reactor Coolant System temperature. During the test, Tave increased above the Tref value by approximately one degree. The increase in Tave caused a decrease in the Overtemperature Delta Temperature (OTDT) setpoint and initiated a 200 Megawatt turbine runback. It was later determined that the installed runback time delay setting was 10.4 seconds which was in excess of the design setting of 1.5 seconds. The result was a further increase in Tave and subsequent decrease in the OTDT reactor trip setpoint resulting in a reactor trip. The turbine tripped from the automatic reactor trip signal. A feedwater isolation occurred on low Tave and an auxiliary feedwater actuation occurred as a result of a low steam generator water level signal. Control room operators verified the reactor trip, turbine trip, power to the Engineered Safety Features busses and the auxiliary feedwater actuation. The Main Steam Isolation Valves were closed to limit the Reactor Coolant System cooldown. The plant safety systems responded as designed. The NRC was notified pursuant to 10CFR50.72 at 1409 hours on September 19, 1989.

CAUSE OF EVENT:

The cause of this event was that the turbine runback setpoint design did not provide sufficient operating margin to allow for small deviations in Tave. A contributing factor was that the amount of turbine runback was set in excess of the values provided in design documents.

ANALYSIS OF EVENT:

Reactor trip and Engineered Safety Features actuation is reportable pursuant to 10CFR50.73(a)(2)(iv). The plant was brought to a stable condition in Mode 3 with no unexpected post trip transients.

The OTDT reactor trip provides core protection against Departure from Nucleate Boiling (DNB). The setpoint is automatically reduced upon an increase in coolant temperature and is dynamically compensated. The turbine runback is a non safety-related feature designed to be used in conjunction with automatic rod position control to anticipate high Tave

and reduce turbine and reactor power sufficiently to prevent a reactor trip. However, as designed, the runback setpoint did not allow sufficient operating margin to prevent unwanted runbacks due to small temperature increases. During this event, the OTDT turbine runback was initiated when Tave was one degree above the Rated Thermal Power value and increasing. The turbine runback further increased Tave sufficiently to receive the OTDT reactor trip.

NL.LER89022.U2

TEXT  
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Turbine runback is not taken credit for in any FSAR Chapter 15 accident analysis.

Analysis was performed of this event which showed that the incorrect setting of the turbine runback time delay circuit did not directly cause the trip. This feature was set prior to initial startup; however, due to the nature of its function, proper operation could not be verified. Therefore, the error in the setting was not detected.

#### CORRECTIVE ACTION:

The following corrective actions are being taken as a result of this event:

1. The OTDT turbine runback has been disabled on both units. Further analysis is being performed to determine if it can be restored without causing unwanted reactor transients or trips.
2. A review will be performed of a representative sample of similar non safety-related functions which could not be verified by test to ensure that their settings are in accordance with design. This action will be completed by April 30, 1990. Based on this review, further corrective actions will be identified and scheduled at that time.

#### ADDITIONAL INFORMATION:

There have been no previous events reported regarding reactor trips due to actuation of the OTDT turbine runback feature.

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ATTACHMENT 1 TO 8910270113 PAGE 1 OF 2

The Light company P.O. Box 1700 Houston, Texas 77001 (713)228-9211  
Houston Lighting & Power

October 19, 1989  
ST-HL-AE- 3267 File No.: G26  
10CFR50.73

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

South Texas Project Electric Generating Station  
Unit 2  
Docket No. STN 50-499  
Licensee Event Report 89-022 Regarding a  
Reactor Trip Due to Actuation of the  
Overtemperature Delta Temperature Turbine Runback Circuit

Pursuant to 10CFR50.73, Houston Lighting & Power (HL&P) submits the attached Licensee Event Report 89-022 regarding a reactor trip due to actuation of the overtemperature delta temperature turbine runback circuit. This event did not have any adverse impact on the health and safety of the public.

If you should have any questions on this matter, please contact Mr. C.A. Ayala at (512) 972-8628.

R.W. Chewning  
Vice President  
Nuclear Operations

RWC/BEM/eg

Attachment: LER 89-022, South Texas, Unit 2

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Houston lighting & Power Company

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File No.: G26  
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cc:

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Revised 06/16/89  
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